overcome, and they were expected to bring their prayer-books, and to supply all the patients who could read with prayer-books and hymn-books. The duration of each service was judiciously limited to one hour; and the assembly and dispersion of the patients were so ordered as to confirm the general seriousness befitting the occasion of their being assembled in such number, and the male and female patients at the same time. In all these efforts the success of the different officers was found to be encouraging, and the appearance of the patients when assembled in the chapel,—300 being present at one time—and the Sunday calmness and general repose of the wards, touched every heart not deadened to ordinary sensibilities. The same spirit was carried into and mingled with the daily life of the wards; no meal was partaken of without a short expression of thanks to the Giver of all things; the Chaplain was soon met daily in every ward, and in every ward was treated with respect; many of the patients rejoicing to see him, and not the rudest offering him any insult. Those whom sickness or infirmity disqualified from going to the chapel were often comforted by short services in the infirmaries; and it was found practicable, with the full approbation of the minister of religion, to admit several to communion; at which solemn and affecting service, as many as fifty patients, together with several of the officers, might be seen congregated. When a death took place, all the last offices were solemnly performed; the coffin was no longer carried to the burial-ground like a common box, but covered with a modest pall, and followed by those who had attended the sick-bed, and not unfrequently by some officers of the asylum; so that now and then, among the latest wishes expressed by the dying, was that of being buried where, almost for the first time in their hapless lives, they had become acquainted with comfort and had felt all the blessed influences of pure charity. And thus, among the substitutes for mechanical restraint, religious attentions, prudently exercised, constituted a substitute of great importance; contributing to calm disturbed minds, to soothe some of the heart's afflictions, to restore order to the habits of those driven out of the world's ranks by distraction, and in all, to some extent, to revive the sense of all the decencies of civilised life.

REMARKS ON SUN-STROKE.

By EDWARD SMITH, M.D., F.R.S.
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In the *Medical Times and Gazette* for July 28, 1860, p. 76, there is an interesting report by Assistant-Surgeon R. Chapple on several cases of sun-stroke, and in a former number similar reports of equal value appeared from the pen of Deputy-Inspector of Hospitals Mr. Longmore. Sir Ranald Martin has also, at various times, published observations upon the same subject. In each of those there is mentioned a characteristic of the disease to which I desire to draw attention, viz. the heat and dryness of skin which is observed both in the early and in the later hours of the attack. Mr. Chapple is so impressed with this fact that on three occasions in a paragraph he makes use of the expression "the skin was intensely hot and dry," and in showing his estimate of the connexion of this phenomenon he also remarks, "I have wrapped patients in wet sheets, by which means I thought I might get the skin to act, but without benefit." Hence all agree in the fact that the skin has ceased to act as the great refrigerator of the body.

The temperature of the air in the shade, as mentioned by Mr. Chapple, was 106° and 110° at 4 a.m., and 97° at 10 p.m., that is to say a temperature at least equal to that which is the almost unvarying standard of the internal parts of the body in a state of health. Hence if the body had been mere dead matter it would have obtained, by radiation throughout the whole day, a temperature equal to that of the living organism in its normal state, but being a living body in which conversion of nutriment must take place and heat be generated, it is evident that at all times of the day and night there would be an excess of heat. This excess, already shown, could not be removed by radiation, and as the function of the skin had ceased, and the respiratory function was lessened in activity, it could not be lessened by absorption, as occurs when a large amount of sensible heat is rendered latent by the act of converting the fluids of the body into vapour in the process of perspiration.

I do not purpose to discuss the physical effects upon the system of this excess of heat, since we have not much precise knowledge upon the subject, but it is evident that in the absence of this refrigeration at the surface, the volume of the blood will be increased on the law of expansion of fluids by heat. There will also be oppression of the heart, from the resistance offered to the current of the blood in the capillaries and with the lessening respiration, there must be accumulation of blood in the lungs. The general symptoms at the period of attack show a state of oppression of all vital actions, and near the termination they are those of exhaustion, or, as Mr. Chapple states, "the patients die worn out." It is also clear that with the suppression of the great outlet for water, it will be impossible to give food and fluids internally, unless, indeed, as in some favourable cases, the kidneys double their activity, for otherwise the fluid either would not gain admission into the circulatory system, or the vessels would become yet further congested.

The point upon which I wish to fix the attention of those who have charge of men exposed to these dangers, is the paramount importance of maintaining or of restoring a free amount of action of the skin, and of pointing out some methods of effecting that. It will be borne in mind, that such a condition is as essential when the external temperature is just under that of the standard temperature of the body in health, as when it is above the standard; for in either case the effects of the excess of heat must be present.

When the skin is acting freely, the fluid converted into vapour carries off from the body 1000 times as much heat as it held when in the state of a fluid, and hence there is a most potent refrigerating power ever acting and needing regulation, and so perfect is it that it is sufficient to carry off any amount of heat which can be generated in natural conditions, provided the supply of fluid to the blood and the activity of the skin, be both free, as is shown by the endurance of dry, hot baths, at 150° to 200° of temperature, for considerable periods. The freedom with which the perspiration occurs, reduces the volume of the blood, and thereby necessitates a call for a further supply of fluid from without; and the heart and lungs being kept free from any undue oppression, duly perform their functions. The heart, however, must act rapidly, so as to convey sufficient fluid to the skin, and the more so that, as I have shown in the *Philosophical Transactions*, for 1859, and elsewhere, the rate of respiration is disproportionably lessened with increase of temperature, and thereby there is a constant tendency to accumulation of blood in the lungs.

As, therefore, it is of the first moment to maintain a due activity of the skin, under the conditions of exposure to great heat, I am desirous to mention the various kinds of foods which in my experiments have evinced the power to aid or retard the activity of that organ, for they must have a daily influence in modifying the liability to the effects of excess of heat.

Nearly all ordinary foods lessen the activity of the skin in the primary processes of their digestion, as is shown by the heat and dryness of the skin at that time: such are animal foods, including flesh, fat, and milk; all kinds of beverages classed under the denomination of alcohols, and also coffee. The substances used in food which increase the action of the skin are tea and sugar.

Of the former, or those which lessen the action of the skin, no doubt alcohols should occupy the first place. In this respect strong spirits have a more powerful action than wines or beers, and it is highly probable that raw and inferior kinds of spirits are also more powerful than finer and purer spirits. I have not found any exception whatever to this statement, for even rum, which acts in a different manner upon the respiration, agrees with all its congeners in this—all alike make, or tend to make, the skin hot and dry. But next to these substances coffee must certainly be placed, and particularly if it be drunk without sugar, or with the addition of milk or brandy. Meat and fats have, perhaps, less influence in this direction, but they nevertheless are powerful agents. Hence it is manifest that although some of these must be ranked among the necessaries of life, and cannot be altogether dispensed with in any dietary, the use of them should be strictly limited when the body is exposed to the evils of excess of heat. In accordance with this statement it is well known that spirits are most destructive, and that the natives of hot climates eschew them, and do not indulge largely in milk or animal food. If they take fat, moreover, it is, perhaps, not very largely, and it is always associated with starchy food, which exerts very little influence over the activity of the skin. It is a very doubtful point as to the propriety of the Government introducing into India the strong ales of this country under conditions so diverse from those in which we drink them, and although they are less powerful in the direction now referred to than stronger alcohols, they must usually be injurious.

With very moderate living it is clear that tea should be regarded as an indispensable adjunct, and that coffee should be excluded at the hot season and during exposure to intense heat, except by the comparative few in whom the skin is usually too active. It should, for the purpose of increasing the action of the skin, be taken without milk or cream in very moderate doses, and very frequently. Indeed, under such conditions it should be the constant beverage throughout the day, but not drunk in large quantities at a time. It appears to me that the importance of this agent is not by any means so well understood as it ought to be, and that it would be to the great advantage of our soldiers if the Government were duly informed as to its value and even its necessity.

I would just add a word in reference to the treatment of cases of sun stroke. It is clear that these cases must be regarded as due essentially to excess of heat in the body, and that independent of exposure to the direct rays of the sun or even to very exceptionably high degrees of temperature. The first remedy usually applied is that of water, which although of lower temperature than that of the body, cannot be called cold, but its free use has been of the utmost service in warding off threatened attacks. In the attacks, however, neither the cold douche, nor the wet sheet have commonly been efficacious, as Mr. Chapple has well shown.

As the greatest of all desiderata is the return of the action of the skin, I venture to hint that beyond a certain duration the direct application of the cool water is likely to be injurious by interfering with any attempts to increase the action; for if remedies be given which increase, or tend to increase, perspiration, their action will certainly be hindered by the application of anything to the skin which has a lower temperature than that of the body.

In this condition I very earnestly commend the use of good tea, in doses of twenty-five grains every quarter of an hour, given in a weak infusion of about three to six ounces and of a temperature but little below that of the body. The action of tea beyond that on the skin already referred to, is directly to increase the vital action through the medium of the nervous system; and it has a powerful and sustained effect in increasing the respiratory functions. Hence it meets so far as it can three of the most urgent wants, viz. cooling of the body, removal of the listlessness and oppression, and increase of the respiratory action—it being clearly understood that respiration has in itself a great tendency to lessen the temperature of the body. Diffusible stimulants, as ammonia, have been found somewhat useful, and that no doubt from their tendency to act through the skin. I have also shown that the addition of alkalies to tea increases the action of the latter substance upon the skin, and hence it would be well to add neutral acetate of ammonia or acetate of potass to each dose of the tea.

Mr. Chapple and others refer to the vomiting which takes place late in the attack, and I venture to ask if it would not be of great value to induce this by ipecacuanha early; for in addition to the good effect of removing matters which may tend to restrain the action of the skin, the act of vomiting tends most powerfully, as we know, to induce perspiration. I do not think the use of an emetic is contra-indicated because there is lessened vital action at the commencement of the attack, for that early condition is, as already mentioned, one of oppression, and not of exhaustion.

I further venture, but with great deference, to recommend the use of warm water (if during the attack the cold *douche* has failed) of a degree about that of the normal temperature of the body, for its efficacy in tending to induce perspiration is well established. I do not think that the addition of warm water to the body suffering from excess of heat is contra-indicated, provided the degree of warmth be not greater than the natural heat of the body, and the drinking of tepid water largely in the early stage must have a right tendency, on the principles already laid down.

In this communication I have not entered into any question but that which I desire very earnestly to commend to the consideration of those who have charge of these very anxious and too often fatal cases.

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GLAUCOMA AND IRIDECTOMY.

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THE treatment of glaucoma by iridectomy, so vehemently attacked by the writer of the article on "Medical Epidemics—Glaucoma and Iridectomy," in the *Dublin Quarterly Journal of Medical Science*, must stand or fall by its results; its success or its failure can be established by experiment only. The experience of the last three years has so completely demonstrated the immense value of Von Graefe's brilliant discovery, that I cannot help regretting the Reviewer's attempts to damage, in the eyes of the Profession, what I have already, in your pages and elsewhere, maintained to be the only known successful treatment of this previously incurable disease. Having, on a former occasion, discussed its relative value in the different forms of glaucoma, and in cognate diseases, I shall not now reopen this part of the subject, but simply state that I have seen no reason to alter the opinions I then expressed. I deny that there has been any suppression of facts, which the Reviewer insinuates; the practice of the Royal London Ophthalmic Hospital is, and has been, before the Profession; and I have reason to believe that the Reviewer, whose style betrays him, was invited, when in London a few months ago, to visit our Hospital, that he might see and judge for himself. The desire to thoroughly test the permanency of cures by a considerable period of time, has hitherto prevented me from publishing cases; but, under the present circumstances, I have selected from my case-book a couple, which are good types of acute, and subacute glaucoma, and capital examples of what iridectomy can accomplish. The previous loss of one eye by each patient gives these cases an additional interest. I shall abstain from further comments and let them speak for themselves.

Case 1.—*Subacute Glaucoma in the Right Eye—Great Contraction of the Visual Field—Dim Perception of large Objects only—inability to read No.* 20 (8-*line Roman*) *Test-type—Iridectomy—Complete Relief, Patient Reading No.* 1 (*Brilliant*), *and working with her Needle.*

Esther S., aged 30, was admitted into the Royal London Ophthalmic Hospital, Jan. 17, 1860, with great dimness of the right (her only) eye; this began as an occasional obscuration two years before, but soon became constant. I found she could not read No. 20 test-type, and that there was great contraction of the field of vision, chiefly of its lower part. The pupil was dilated, and nearly motionless. The globe was very hard, much congested, and painful. A haziness of the humours prevented an accurate exploration of the fundus. I could only see that the retinal veins were turgid, and I thought that the optic nerve-entrance was very slightly excavated.

20th.—I excised the upper and outer one-seventh of the whole iris in its complete breadth.

24th.—The congestion was much less; the tension of the globe was natural, and she could read the smallest type on her ticket (nearly equal to No. 10 test-type).

31st.—She was made an out-patient. The redness of the globe had disappeared. Vision continued to improve.

February 10.—The tension of the globe continued natural. She reads No. 2 test-type.

17th.—Read No. 1.

May 11.—Ditto.

August 25.—When I last saw her was about a month ago, she read No. 1 with ease, and did needlework. Her left eyeball was sunken. She said it had been pricked in an